

Day 1 Session 1: Understanding Our Community

What barriers or challenges to participation and belonging have you experienced or witnessed in your career? What has or would have helped in tackling these barriers?

"absence of mentors who have expressed living similar experiences to me. limited opportunities for support."

"After I had my baby, I noticed a dramatic lack of inclusion. The perception was that I didn't have time to collaborate."

"Not only mothers (although VERY MUCH MOTHERS), but also adults caring for disabled family members, need support"

"and lack of adequate resources, such as nursing mother's rooms and child care at conferences/meetings"

"yes, I'm really wondering if the crickets from my collabs for new projects are related to my multi-year health challenges that have substantially impacted my work (including funded project work)"

"there is also very little to no support for those struggling with infertility and having to spend copious amounts of money, time (including a lot of leave), and energy trying to start a family (while also trying to stay active in the workforce)."

"<--and/or recurrent pregnancy loss and all the associated issues (physical, mental) with long term treatment and medical care, none of which can be "advertised" on our CVs or acknowledged as an achievement--surviving our jobs during all this tragedy is, quite frankly, miraculous"

"Unrealistic or unhealthy expectations from advisors / professors. Professor and department level refusal to recognize or support mental health."

"So true! I was lucky to have an advisor who encouraged me to find professional mental health support."

"lack of knowledge and/or direct access to opportunities -- many are "word of mouth" or about who you know who knows (or who has participated in the past), as well as institutional knowledge. it's not necessarily easy (but easier than it used to be!) to find things on Google (how do you ask the question if you don't necessarily know the best words to use?)"

"shared documents disseminated in the community (that may/may not reach everyone :-/) about job opps, internships, awards, grad student/postdoc openings that can be edited by all has increased visibility somewhat"

"When the vast majority of the people in the room do not look like you (age, race, experience, etc.) it can be intimidating to become an active voice."

"Being expected to represent "everyone like you" is a heavy burden that stops people from speaking up"

"Also the fear of being wrong or not taken seriously."

"Brian Troutman's point about being in increasingly non-diverse groups as one progresses career-wise really resonated. This is something that's made me more self-conscious about participating at times."

"There is a lot of expectation for minorities in the field to be doing the majority of the EDIA work along side their research/studies which puts added pressure/guilt to balance everything in an already challenging environment. I hope that everyone can be involved in EDIA work, not just minorities, especially in academia!"

"Double-blind proposal reviews are showing improvement for women (perhaps other underrepresented groups as well), thankfully. <also recognizing that bias has always been there :-(>"

"And can we talk about the fact that only ~20% of proposals are funded? And these are NEVER asking for 100% FTE."

"Funding in all spheres - for actual IDEA efforts, for stable scientific employment, etc. - is insufficient. Money would be an important tool to overcome all of the barriers."

"yes!! and an "unwritten expectation" to ask for 30% or less time per proposal because of how it will "look" to the panel (and also cost issues)"

"Prompted by Adeene's talk: feeling tokenized can be hard!"

"During my undergrad in a room of PhDs, being completely ignored and excluded because i was just an undergrad!"

"A few years ago, I noticed a co-worker (single, male, non-parent) was getting a lot of travel opportunities I was not. When I spoke with my supervisor, they mentioned specifically not offering those opportunities to me specifically because I had small children at home and they were concerned I wouldn't be available. Had to be blunt about letting me make the decision about turning down an opportunity and not making assumptions on my abilities based on my parental status."

"Studies show social media is damaging for mental health, yet the community largely uses social media outlets to communicate many opportunities. As someone who doesn't use social media, I miss many smaller meetings/discussions/events."

"Agreed, and this doubles for "whisper networks" via Twitter/Instagram DMs. Not participating in social media means losing out on those networks"

"As a student, I often feel like even the professors who say they prioritize mental health, still prefer / expect unhealthy performance levels"

| "Agreed. Also, not just professors, but entire institutions..."

"Social Scientists have shown that scientists judge their friends to be better scientists than scientists they don't know (see Janet Vertesi's latest book). We need to be more aware of this bias. -Julie"

| "thank you for the book recommendation, Julie!"

"How about figuring out how to do away with cultures of judgment? Why do we do this to ourselves?"

What would an inclusive lunar science and exploration community look like, in your view?

"Realizing that science is NOT done by individuals. Making sure that people are judged NOT just on specific scientific skills, but also the "so-called" soft skills. Scientists need to get better at working in groups and not allowing bad behavior. OK, Adeene just said this better than I did."

"Having balanced participation on DEIA committees across various demographics. Every committee I've sat on is overrepresented in racial/ethnic and gender minorities and underrepresented in white men"

"acknowledgment that we as individuals are complex and likely have multiple, complex priorities that may or may not change with time. having passion for and commitment to our science/exploration community does not necessarily equate with working >40hrs per week, attending every single meeting, "eat/sleep/breathe" work. other priorities, such as family, personal health (mental and physical), extracurricular interests are valid and may mean someone is not up to giving 100% to the job all the time."

| "Making a mental shift to not expecting 100% to be focused on any one project, be it work, parenting, volunteering, physical health, etc."

"A fundamental transformation in how exploration is viewed - i.e., collaboratively rather than "hero mode," which requires an overturn of funding sources and organization structures."

| "Book recommendation: Steven Johnson's _Where Good Ideas Come From_ has a solid debunking of the "lone genius" theory of science advancement"

"I would love to see EDIA work more valued by our institutions."

| "Making EDIA effort part of annual performance plans, part of tenure/promotion/pay raises is mandatory"

| "Also have NASA require EDIA effort in CVs submitted to NASA proposals."

"restructuring of funding sources and org priorities to dedicate time/\$ to inclusion, and sustain that commitment over years to decades."

"Less emphasis on having gone to one of a few select grad schools - they are the gatekeepers"

| "Yes, this is another serious exclusive pipeline issue that also takes away from diversity of thought or approach"

"I would like to see a full stop to stories of harrassment from both academic institutions AND companies. And consequences for institutions that allow this behavior."

| "Agreed, NSF PI/Co-PI anti-harassment policy is a good framework, but could still be improved wrt consequences for institutions and individuals who perpetuate harm"

Other Reflections

"Agree we need to infuse DEIA into our work, however, NASA needs to provide adequate support & infrastructure to enable meaningful DEIA. Do not put the prime responsibility on PIs to figure out how to do this. We are Planetary Scientists, not experts in DEIA. There are entire academic fields of study and research re. how to infuse diversity and inclusion. NASA should learn about this and lean on these communities - not dump this responsibility on Science PIs (like PRISM has done, for example)."

| "Agreed! People spend their careers studying DEIA problems and solutions. Let's invite them in to help!"

"I'd argue that PIs are already expected to be experts in non-science topics (eg engineering). PIs need to well versed in DEIA, but not be experts, they can hire DEIA experts just like they employ engineers. – Julie"

"Agree! And Julie's idea requires \$\$, and also someone, somewhere, connecting PIs with DEIA experts who can partner on proposals. Bringing these cultures together can be non-trivial."

"and for PRISM, it is allowable to spend \$ on inclusion efforts. this could include hiring an outside expert on DEIA issues. we don't expect the PI to have to be the expert."

"It's not as simple as "just go hire a DEIA expert". There is a huge learning curve (on both sides) to bring outside experts to NASA proposals & projects. Not all communities or institutions work like Planetary Science does. NASA HQ could do some work to help bridge these gaps."

"We (SMD) are certainly working on things related to this (which unfortunately I can't describe yet because nothing is official, so sorry for the vagueness!).
~ Ryan"

"This is good - recognizing the problem is the first step!"

"I really resonate with Adeene's points about how non-masc bodies are almost completely ignored."

"Agree with Julie's point that NASA/SMD (incl. R&A) will show IDEA is taken seriously when actual \$\$ is spent addressing the issues."

"Yes! Also love the idea of climate surveys."

"I really liked Julie's point about not requiring more proof of the problem!"

"DEIA is an ethical position - failure or sidestepping is unethical"

"Can plans include aspects that make them resilient to political changes outside of institutions?"

"Snaps to Adeene's point about emphasizing teamwork!"

"I'd like to understand how ESSIO does/can/could support diversity, equity, inclusion and accessibility."

We've had a lot of discussion DEIA in planetary science, and I think there is some momentum within PSD and SMD to make changes. We're no where near success, I can at least *imagine* a path for how PSD and SMD may factor DEIA into grant and mission selections and other activities.

However, I don't see that as clearly in lunar exploration. Maybe this is my own ignorance, or perhaps it's because lunar exploration is distributed across so many different programs, directorates (SMD, SpaceOps, ESDMD, etc.), commercial/international partners.

Since this is LSSW, and ESSIO is presumably the most receptive audience, I'd like to know ESSIO's role in this. For example, how does DEIA factor into PRISM and CLPS selections? Can NASA place requirements for DEIA on commercial contracts?

-James Keane"

"TLDR: What's ESSIO going to do about this all?"

"ESSIO cares very much about IDEA (and several of our members are very active in SMD IDEA groups). First, ESSIO is part of SMD, so there's overlap there. We cannot use demographics to make selections (e.g., PRISM), but initiatives such as our inclusion plan pilot program are one avenue we are pursuing to increase and support inclusion in lunar science efforts. SMD as a whole is learning from these early pilot programs and evolving the language."

- Ryan W."

"Thanks Ryan!"

I guess, what I'm asking is are there other knobs that ESSIO has (whether they're recognized as knobs or not) to address DEIA that are different than PSD and other parts of SMD? For example, ESSIO has bridges to other parts of NASA (ESDMD, SpaceOps).

Another related question is, what is NASA/ESSIO hoping to get out of this particular LSSW?"

"What kind of "knobs" do *you all* think/would like to see ESSIO turn with other directorates?"

"I think that's a great question to open up to the group."

"Show me your budget and I'll tell you your priorities".

"but please know that the individuals working on these things DO care. we are doing our best to move these changes up to levels higher than us. sometime budgets are outside of our own personal control, but we're really doing our best with what we have."

Day 1 Session 2: Creating Systemic Change

What systemic changes would you like to see implemented at institutions engaged in lunar science and exploration?

"Publicly available compensation statistics, broken down by demographics and key career metrics (e.g. education, years of experience, etc.)"

"A way to hold tenured faculty accountable"

"Universal training for communication styles and conflict management (e.g. Crucial Conversations)"

"Shaping Science, J. Vertesi (book recommendation!)"

"Land acknowledgements and Indigenous perspectives on human and robotic exploration of culturally significant lunar features"

"not just acknowledgement, but actionable, remedial effort to engage with indigenous knowledge ways and sovereignty."

"Creating an Office of Tribal Affairs"

"And don't overlook Indigenous groups that do not identify as "tribal" (ex. Native Hawaiian)"

"Access to and funding for DEIA professionals to add to our teams."

"speaking for PRISM only, it is allowable to use funds for any inclusion plan efforts, including hiring professionals. the funding aspect is something I'm personally interested in pursuing further as we refine this process."

~ Ryan"

"I think it would be worth looking into how NSF has funded DEI efforts in the past. In many respects, I think NASA could learn a lot from their experience."

"A central location for information on how/opportunities to join teams/projects (less word-of-mouth or "who you know")"

"Professional societies could be doing a lot here (edit: for free!! provide free student memberships, host open source resources like shared google docs)"

"Value DEIA and other "group organizing" work. Demonstrate it is valued by giving it time/money/awards,etc. This includes conferences, proposals, and other spaces."

"also "credit" in annual assessments and reviews by institutions. many institutions expect individuals to do certain things (outreach, community service) but do not recognize or acknowledge these activities when it comes to potential for advancement or performance evaluations"

"For example, not feeling like I have to work overtime because I spent today at this conferences"

"Institutions that underpay and overwork grad students are asking grad students to subsidize their preferred programs. There should be clear guidelines for minimum standards for treatment at all career levels."

"Hard agree. We severely underpay undergrad and grad students, postdocs, etc."

"and they often put in more hours than they are paid for"

"A well-defined "advancement structure" that creates a formal ladder from student to senior scientist (e.g. formal mentorship plans)."

"I think one of the biggest challenges for lunar science and exploration is the overall structure of NASA's lunar activities. Activities are decentralized, and spread over many directorates (SMD, ESDMD, SpaceOps), divisions, programs (Artemis, SLS, Gateway, etc.), commercial partners, groups (LEAG), etc. I worry that this lets a lot of things, including science and DEIA, to fall through the cracks."

"This structure is largely incomprehensible outside of NASA but still creates barriers to outside institutions who are seeking to do work with/for NASA, especially newer organizations that could bring more diversity to projects."

"Echos of the "third spaces" that Janet Vertesi talked about. Some individual groups have institutionalized policies (e.g., individual labs, divisions), but lunar exploration happens at the intersection of different groups/institutions/agencies"

What successes (big or small!) have you had in enacting institutional changes? What challenges have you experienced?

"When there is no sense of personalization, the problem seems to disappear. Unless something happens to you, it does not exist. And I think that is one of the biggest problem."

"Meetings with management about changes we'd like to see enacted. It was a (very) small success to get management to commit time to listening to our group."

"One challenge I've found in academia is getting institutional leadership to commit to specific actions e.g. funding Black grad students, instead the tendency is to make vague promises/statements that are simply performative EDIA rather than actual actions with impact"

"... and the talking stage! "That's something we need to talk about" - no, it's something you need to DO something about!"

"The perpetual planning stage..."

"Agreed, the successful initiatives I have seen had adequate funding! Committing real \$\$ is key, especially to support grad students/ECR"

"The biggest challenge I've faced is from folks who just don't care. Because of their privileged positions, they don't see the problems. And, they don't like hearing about them. They're not used to feeling "bad" and don't know how to deal with it."

"or they panic and throw everything at you which is only discouraging"

"or sometimes don't have the resources/availability/time to care because the effort is not incentivized. :("

"or it's not their own experience, so they don't recognize or value it"

"This problem makes bias reporting sometimes feel futile since it seems like no actions occur"

"a challenge is burnout- sometimes even when there is funding there needs to be additional support or else the few individuals working on the issue will burnout"

"One of the challenges is being early career and having everything I do for work judged as a part of promotion considerations and anything that doesn't result in a publication is not seen as a positive point on my CV"

"I propose that having this workshop as part of the LSSW series is its own success. Glad to see this happening, and look forward to continued work. Kudos to the organizers!"

"I'm thrilled I received NASA funding for a program with Native nations in which we did NOT have data to "prove" our concept. It showed me that NASA is eager to work with the nations."

"These discussions were unheard of 30 years ago."

“Paraphrasing Dr. Shope, these discussions were happening, but perhaps less visibly. Should maintain continuity of efforts.”

“A challenge I've seen is that the groups working on this change are tired and want to hold ourselves to high standards and end up 'eating' each other if someone missteps or makes a mistake. We are all in a situation of global exhaustion in addition to the layers of exhaustion and burnout by people doing organizational labor toward change. We need to hold each other with empathy too, or the cause will not advance.”

“leaning on subject experts, rather than asking scientists to speak to areas in which they aren't familiar - Earth science major now explicitly including courses from the American Indian Studies department to address extractive harms in the geosciences. Resources within the institution are (may be) available, if we look outside institutional silos.”

“Some missions and workshops are instituting codes of conduct and trying to hold each other to account for their actions.”

Other Reflections

“Informal, “third space” cultures pose problems for neurodiverse persons who struggle with less formal structure”

| +100!

“I'd be curious to know more about differences in institutional climate (e.g. academia vs. industry) within the lunar community.”

“Highlighting: “All inclusive practices require funding - any unfunded effort is extractive.” Thank you, Dr. Armstrong.”

“I saw a story on the news today about several baseball players not being placed into the hall of fame, even though they are well regarded to be good players, because they have rumors of drug use. I want to know why we can deny Hall of fame membership based on rumors, but if you suggest denying awards or fellowships to scientists due to rumors of sexual harassment, the immediate response is, “but you have no proof.”

“Read Castilla's “Paradox of Meritocracy.” Merit-based advancement is a great way of making it seem like there are clear standards but really extending or denying them at will.”

“I thought the talks in this session were great in terms of making me think beyond just “representation” as a goal.”

Day 1 Session 3: Pathways and Bridges

How could those of us involved in lunar science and exploration engage more meaningfully with wider communities?

"I would really like to see us engage with communities on a more equal footing, rather than acting as though we're doing them a favor. :-)"

| "parachute science" but for outreach"

"Nothing like other people making you feel as though you don't "deserve" it or questioning how you got there."

"Seek out communities, don't wait for them to reach out! But do so respectfully wrt this note"

"Seek out conversations with those communities not present, but start by asking what they *want* first. Don't assume a community wants to participate."

"Start a relationship first: don't go to a community with an immediate "ask" or "invite" which can feel extractive."

| "You may learn a lot just through observation."

"Can you describe your science to college students? High schoolers? Middle schoolers? There's your future workforce so think about where you are"

| "And they will find it fascinating. The best questions come from speaking with those generations."

| "Adding to this - adults too! Non-scientist adults (post-public school age) can be hard to reach, but still have unique skillsets and knowledge"

What resources would enable you to build a more inclusive professional community? What support have you received or wished for from your colleagues?

"Something like the "PDART" program for making spacecraft data more accessible, esp. to deaf/blind scientists or members of public?"

| "Hub for such resources (from Dr. Ahrens' talk)"

"Funding for relationship building. And funding agencies seeing this as important."

"Groups like AISES, NSBP, etc. Support for participating in those meetings."

"Groups like the Women of Color Project and Black in Astro are doing important work."

"Public praise of diversity and inclusion work the same way we praise technical achievements"

Other Reflections

"Where does a person being systemically and procedurally pushed out of their DESIRED career path fit into the braided pipeline model? E.g. Someone in an underrepresented group in faculty,

who wants to be a faculty member, but meets so many barriers they are pushed into a different career field through no fault of their own.”

“I *love* the braided river analogy (so much more than the pipeline)!”

“Serves as an example of needed systemic change - academia could sure use a broadening of the definition of success and do a better job educating students about non-academic pathways.”

“I put this in the chat, but in case you miss it: Glad to see these changes in a favorite classic! Richard Scarry’s Best Storybook Ever gets a needed #DEIA update:

<https://www.upworthy.com/8-changes-that-were-made-to-a-classic-richard-scarry-book-to-keep-up-with-the-times-progress?rebelltitem=9#rebelltitem9>”

“The way we describe people and occupations, etc. is important. Representation even in a book is a necessary step toward DEIA.”

“In talking about funding, the Science Activation Program is within SMD and funds a lot of IDEA programs. Look at the end of ROSES!”

“These were all great talks! So much to think about...”